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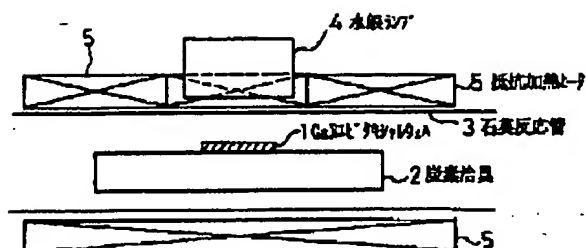
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TITLE : HEAT-TREATMENT OF GALLIUM
NITRIDE CRYSTAL



ABSTRACT : PURPOSE: To promote the activation of p-type impurity for getting a sufficient amount of p-type carriers at a low doping amount, to suppress the generation of crystal defect caused by a large amount of impurities and to obtain a blue- light emitting diode having improved luminance,

CONSTITUTION: A GaN epitaxial wafer 1 having an $\text{Al}_x\text{Ga}_{1-x}\text{N}$ or $\text{In}_y\text{Ga}_{1-y}\text{N}$ layer is formed by an organometallic vapor-phase growing process using ammonia as the nitrogen raw material. A p-type impurity such as Mg and Zn is doped in the growing stage to form a p-type crystal epitaxial layer. The doped p-type impurity is activated by placing the GaN epitaxial wafer 1 on a jig 2 inserted into a reaction tube 3 having a resistance heater 5 wound on the tube and heat-treating the gallium nitride crystal in nitrogen atmosphere under irradiation with ultraviolet rays using a mercury lamp 4. The ultraviolet rays have wavelengths of 200-350nm to excite the electric charge of hydrogen atom taken into the crystal together with the p-type impurity to the valence band.

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